

**REMARKS**

In the present Amendment, independent claim 1 has been amended for clarification. Claim 1 has been further amended to recite that the solid, super-strong acidic substance comprises a primary component containing a  $\text{ZrO}_2$  carrier (a recitation of claim 5) and a secondary component containing an oxide or an oxide ion. Accordingly, claims 2-4 have been canceled.

The preamble of claim 1 has been amended to recite an ammonia sensor for detecting ammonia gas. Accordingly, claim 21 has been canceled.

Claim 5 has been amended to conform with the amendment to claim 1.

Claim 6 has been amended to conform with the amendment to claims 1 and 5.

Claim 13 has been amended for proper antecedent basis.

Claims 14 and 15 have each been amended to depend from claim 1.

Claims 19 and 20 have been amended for purposes of clarity, proper antecedent basis and to remove duplicate subject matter.

Claim 22 has been canceled without prejudice or disclaimer.

Support for new claim 23 is found, for example, in present independent claim 1, original claims 3 and 4, and the non-limiting embodiment illustrated in Table 1 at page 36 of the present specification.

New claims 24-25 and 26-32 correspond to present claims 9-10 and 12-20, respectively, except that new claims 24-25 and 26-32 depend directly or indirectly from independent claim 23.

No new matter has been added, and entry of the Amendment is respectfully requested. After entry of the Amendment, claims 1, 5-20 and 23-32 will be pending.

In response to the rejection of claim 22, depending from independent claim 21, as being a substantial duplicate of independent claim 1, claim 22 has been canceled.

Withdrawal of the rejection is respectfully requested.

Claims 1-3, 9-10 and 19-22 were rejected under 35 U.S.C. § 102(b) as being anticipated by Raju.

Claim 1 as amended is directed to an ammonia sensor having a solid, super-strong acid comprising  $\text{ZrO}_2$  as a primary component, as recited in original claim 5. Raju does not disclose or suggest an ammonia sensor having a solid, super-strong acid comprising  $\text{ZrO}_2$  as a primary component. Moreover, this difference is acknowledged in the Office Action because claim 5 was not subject to the above rejection.

Withdrawal of the foregoing rejection is respectfully requested.

Claims 1-3, 9-10 and 13-22 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Raju in view of Kornely (EP 1008847) or Yamazoe (JP 4-29049).

The Examiner concedes that Raju does not disclose materials other than  $\text{MoO}_3/\text{TiO}_2$  and  $\text{BiMoO}_6$  for an ammonia sensor or supporting the  $\text{MoO}_3/\text{TiO}_2$  material on a support. However, the Examiner cites Kornely as disclosing  $\text{WO}_3/\text{TiO}_2$  and a metal oxide support and Yamazoe as disclosing a mixture of acidic oxides, such as  $\text{V}_2\text{O}_5$  and  $\text{Cs}_2\text{O}$ , with metal oxides, such as  $\text{SnO}_2$  and  $\text{TiO}_2$ , for use in a gas sensor.

As noted above, amended claim 1 is directed to an ammonia sensor having a solid, super-strong acid comprising  $\text{ZrO}_2$  as a primary component, and Raju does not disclose or suggest the same or similar structure. Kornely and Yamazoe, alone or in combination, do not make up for the deficiency of Raju. That is, none of Kornely and Yamazoe disclose an ammonia sensor

including a sensitive section composed of a solid, super-strong acidic substance comprising  $\text{ZrO}_2$  as a primary component.

Because the asserted combination fails to disclose all of the elements of the amended claims, the cited references do not establish a *prima facie* case of obviousness and withdrawal of the foregoing rejection under 35 U.S.C. § 103(a) is respectfully requested.

Claim 12 was rejected under 35 U.S.C. § 103(a) as being unpatentable over Raju in view Inoue (JP 2000-5584).

As noted above, Raju does not disclose or suggest an ammonia sensor having a solid, super-strong acid comprising  $\text{ZrO}_2$  as a primary component. Inoue also fails to disclose this characteristic feature of the invention and therefore does not cure the deficiency of Raju.

Withdrawal of the foregoing rejection under 35 U.S.C. § 103(a) is respectfully requested.

Claims 1-22 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Schmelz (U.S. Patent No. 5,546,004) in view of Raju and Wang (U.S. Published Patent App. No. 2002/0146352).

Applicants traverse, and respectfully request the Examiner to reconsider in view of the following remarks and the amendment to the claims.

Schmelz was cited as disclosing an ammonia sensor including a sensor material made of  $\text{TiO}_2$  with  $\text{WO}_3$  and  $\text{MoO}_3$ . Schmelz does not disclose or suggest an ammonia sensor having a solid, super-strong acid comprising  $\text{ZrO}_2$  as a primary component

In the first full paragraph on page 6 of the Office Action, the Examiner cites to Wang at [0042] as disclosing sensor materials made of  $\text{WO}_x/\text{ZrO}_2$  and  $\text{SO}_4^{2-}/\text{ZrO}_2$ .

However, there is no apparent reason which would lead one skilled in the art to combine Wang with the disclosure of Schmelz and Raju.

Wang is directed to protecting a precious metal catalyst from poisoning or inhibition by compounds commonly present in work place atmospheres. For example, Wang discloses that these “poisons” include organosilicons, organoleads, organophosphates, sulfur-containing compounds and halogenated hydrocarbons. See Wang at paragraph [0005].

Thus, Wang discloses an outer layer of oxide-supported catalytic materials, such as  $\text{WO}_x/\text{ZrO}_2$  and  $\text{SO}_4^{2-}/\text{ZrO}_2$ . This outer layer is provided to trap catalyst poisons and provide an inner gas-sensing element with long-term stability against poisons. See Wang at paragraph [0020] & [0013].

However, Wang does not disclose ammonia ( $\text{NH}_3$ ) among these poisons. Further, Wang does not mention ammonia anywhere within its disclosure. Thus, Wang cannot be said to teach or suggest to a person having skill in the art that  $\text{WO}_x/\text{ZrO}_2$  and  $\text{SO}_4^{2-}/\text{ZrO}_2$  could be employed *as an ammonia sensor*.

Moreover, since Wang discloses a *poison protection layer* containing  $\text{WO}_x/\text{ZrO}_2$  or  $\text{SO}_4^{2-}/\text{ZrO}_2$  over a combustion gas-sensing layer, there is no motivation to employ Wang’s protection material as the gas-sensing layer in Raju and/or Schmelz.

In other words, the inventive combination of the present claimed subject matter is more than a predictable use of prior-art elements.

Turning to dependent claim 6, Schmelz, Wang and Raju do not specifically disclose an agent for stabilizing the crystal structure of  $\text{ZrO}_2$ . For example, present claim 6 recites that the structure-stabilizing agent comprises at least one of  $\text{CaO}$ ,  $\text{MgO}$ ,  $\text{Y}_2\text{O}_3$ ,  $\text{Yb}_2\text{O}_3$  and  $\text{Ga}_2\text{O}_3$ .

In view of the above, Applicants respectfully request withdrawal and reconsideration of the §103(a) rejection of claims 1-22 based on Raju and Wang.

Allowance of claims 1, 5-20 and 23-32 is respectfully requested.

In view of the above, reconsideration and allowance of this application are now believed to be in order, and such actions are hereby solicited. If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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